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FAMILY LYCEUM.

JOSIAH HOLBROOK, EDITOR.

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THE ANCIENTS.

CYRUS.

CYRUS, the famous founder of the Persian monarchy, and the restorer of the Jews to their country, their temple, and their former state, was the son of Cambyses, and Mandane, the daughter of Astyages, B. C. 599. Cyrus, beautiful in his person, and more amiable for the qualities of his mind, lived with his father during the first twelve years of his life, and was educated after the Persian manner in hardship and toil, and all such laborious exercises, as would tend to fit him for the fatigues of war, in which he unquestionably excelled all his contemporaries. At this early period he surpassed all of his age, not only in aptness to learn, but in the courage and address with which he executed whatever he undertook. After this he was sent to Media to the court of Astyages, his grandfather, with whom he lived about five years. Here his conduct was so excellent and amiable, notwithstanding the pride, luxury, and magnificence which prevailed in the court of Media, that he was generally beloved, and laid the foundation of that attachment to his person which enabled him afterwards to perform the exploits which are recorded of him. He was affable, gentle, beneficent and generous. Whenever the young lords had any favor to ask of the king, Cyrus was their solicitor. If the king had any subject of complaint against them, Cyrus was their mediator; and he always manged their affairs so well, that he never failed of obtaining what he desired. When he was sixteen years of age, he accompanied Astyages in an attack upon the Assyrians, who had made inroads upon the Persian territories; his behavior on this occasion was such, that the victory obtained was imputed to his energy and superior prowess. Soon after this he returned to his father, with whom he resided till he had attained the age of forty, when he was called forth to the assistance of his uncle Cyaxares, by whom he was appointed generalissimo of the Medes and Persians. This led to the establishment of that vast empire, of which he was the founder, and which he erected upon principles of so much wisdom, that it existed in spite of the weakness and the wickedness of his successors, for a period of two hundred years. In this sketch we shall not attempt to follow the hero in all his contests.—In every instance, where valor and wisdom were required, he was found possessed of all those qualities that can render a man and a prince truly great. After a signal victory obtained by Cyrus over the Assyrians, aided by Crœsus, a young princess of exquisite beauty was found among the prisoners of war, and in the division of the spoil she was reserved for Cyrus. Her name was Panthea, the wife of Abradates, king of Susiana. Upon the report made to Cyrus of her extraordinary beauty, he refused to see her; fearing, as he said, that such an object might engage his affection more than he desired, and divert him from the prosecution of the real design which he had in view.

When he had dethroned the Lydian king, he completed the reduction of all Lesser Asia and Syria, and then turning his arms against the king of Assyria, he invested Babylon, which he took after a siege of two years, and thus put an end to that great and powerful monarchy, B. C. 538.

The destruction of Babylon forms a very interesting event both in profane and sacred history; and, more particularly, in its reference to the predictions of Scripture and the subsequent state of the Jews. Isaiah, who began to deliver his predictions in the year B. C. 757, and who was put to death B. C. 696; and Jeremiah, who died about the year B. C. 577, expressly foretold the destruction of this city, together with several circumstances that attended it, and that marked it as a very important era in the history of the world. Both these prophets speak with such assurance of its destruction, and of the manner in which it would be brought about, that they seem to describe a future event as if it had already occurred, and they had been witnesses of the catastrophe.

Cyrus, who was the destined conqueror of Babylon, and who transferred the empire from the Babylonians to the Medes and Persians, was foretold by name above an hundred years before he was born. The time of the reduction of Babylon was specifically marked out by the prophet Jeremiah. The facts agreeing with these prophecies, are related by no less historians than Herodotus and Xenophon; and Isaiah lived above two hundred and fifty years before Herodotus, and nearly three hundred and fifty before Xenophon; and Jeremiah lived above one hundred and fifty years before the one, and nearly two hundred and fifty before the other. As Cyrus took Babylon in the year B. C. 538, Isaiah delivered his prophecies at least one hundred and sixty years before the taking of Babylon, and Jeremiah sent his prophecies concerning Babylon, to Babylon by the hands of Seraiah, 'in the forty-fourth year of the reign of Zedekiah,' Jer. li. 59, which was fifty-six years before the taking of Babylon, for the fourth year of Zedekiah coincides with the year 594 B.C. That the destruction of Babylon was complete and final, is no less expressly foretold and minutely described than other circumstances attending this event.

After Cyrus had settled his affairs at Babylon, he went into Persia to make a visit to his parents, who were still living; and on his way thither through Media, he there married the daughter of Cyaxares, called in Scripture, Darius the Mede, having with her as a dowry the kingdom of Media in reversion, and then with his wife went to Babylon.—He now, viz. in the year 536 B. C. issued an edict, which has given celebrity to his name, permitting such of the Jews as were remaining from the Babylonish captivity to return to Jerusalem and rebuild their temple. This decree was certainly obtained by the intercession of the prophet Daniel, who was already highly famed for his wisdom and integrity, in a licentious and truly infamous court. In Daniel, Cyrus seems to have placed the highest degree of confidence, which the prophet turned to the advantage of his oppressed countrymen. From concurring testimony, he no doubt pointed out to the prince the prophecies of Isaiah, in which himself was pointed out by the finger of heaven, as destined for the most important purposes; as designated to be a great conqueror and the restorer of the Jews to their native land. The learned Prideaux offers many reasons that might have concurred to induce the conqueror to comply with the urgent solicitations of the prophet, his friend and principal minister. Though Cyrus was born and brought up as an idolater, the interposition of providence must occasionally have made an impression on his mind, which Daniel seems to have converted to the best ends.

He speaks in his decree in the name of the Lord of Israel; he was too wise to believe in the gods which his countrymen and the world in general were accustomed to worship, and was probably too much enlightened to refer the passing events of life, and the revolutions of empires, to what the ignorant would denominate chance. He had heard of the hand writing on the wall, which none but Daniel could explain; and he only, according to his own profession, by the interposition of his God. He had been informed of the deliverance of the same excellent man from the lion's jaws, and he might be almost, if not altogether persuaded, that the God of Israel was the God that had made him 'king of the whole world.'

Cyrus not only pemitted and encouraged the Jews to return to their own country, but readily restored all the sacred vessels and furniture which Nebuchadnezzar had brought from Jerusalem, and deposited in the temple of Baal. Having established his empire, which was bounded on the east by the river Indus, on the north by the Caspian and Euxine seas, on the west by the Ægean sea, and on the south by Ethiopia and the sea of Arabia, upon a foundation not easily shaken; he fixed his residence in the midst of all these countries, spending generally seven months of the year at Babylon, in the winter season, on account of the warmth of that climate; three months at Susa, in the spring of the year, and two months at Ecbatana, during the heat of the summer. Seven years being spent in a state of tranquillity, as he was equally beloved by his own natural subjects, and by those of the conquered nations, he returned into Persia, which was the seventh time from his accession to the whole monarchy. At this time he was about seventy years of age, thirty of which had elapsed since his having been first made general of the Persian forces and from the capture of Babylon, and seven from his beginning to reign alone after the death of Cyaxares. His life had been uniformly sober and temperate, and he therefore enjoyed to the last a vigorous state of health. When he perceived that the time of his death was drawing near, he ordered his children and the chief officers of the state to be assembled near him; and after having thanked the gods for all their favors to him during the course of his life, and implored similar protection and favor on behalf of his children, his country, and his friends, he declared his eldest son, Cambyses, his successor; and left the other, whose name was Tanaoxares, several very considerable governments. He gave them both excellent instructions, and represented to them that the mean strength and support of the throne were neither the vast extent of countries, nor the number of forces, nor immense riches, but a due respect for the gods, a good understanding between brethren, and the art of acquiring and preserving true and faithful friends. After having given his hand to be kissed by all who were present, finding himself at the point of death, he added these last words: 'Adieu, dear children, may your lives be happy; carry my last remembrance to your mother. And for you, my faithful friends, as well absent as present, receive this last farewell, and may you live in peace!'—Having closed his address, he covered his face, and died, according to Xenophon, at the age of seventy. He was buried at Pisargarda, and his monument was to be seen in the time of Alexander the Great.

Cyrus, says M. Rollin, may be justly considered as the wisest conqueror, and the most accomplished prince, whose name occurs in profane history. He possessed all the qualities requisite to form a great man; wisdom, moderation, courage, magnanimity, noble sentiments, a wonderful ability in managing men's tempers and gaining their affections; a thorough knowledge of all the branches of the military art, as far as that age had carried it; a vast extent of genius and capacity for forming, and an equal steadiness and prudence for executing the greatest projects.—As real merit was the foundation and support of his government, he affected no self-importance and haughtiness of demeanour, but strove to render himself affable and easy of access; and he was amply compensated by the cordial affection and respect of his people. He was beloved, and had many friends because his sentiments were kind and liberal, and he was friendly in his disposition and conduct. Cicero observes, (Lib. I. epist. ii. ad iii. fratrem), that during the whole time of Cyrus's government, he was never heard to speak one rough or angry word; and this showed a very singular degree of self-command. It was his invariable persuasion, that all his purposes and labors should tend to the happiness of his people. Whilst he was one day discoursing with his courtiers upon the duties of a king, he observed that a prince ought to consider himself as a shepherd; and that he ought to have the same vigilance, care, and goodness. Many great and good characters have been formed by adversity and affliction; but Cyrus was great and good without this kind of discipline. He himself informs us, that during the whole course of his life, the happiness of it was never interrupted by any unfortunate accident, and that in all his designs the success had answered his utmost expectations. He adds, however, that in the midst of his uninterrupted prosperity, he still reserved in his heart a secret fear, proceeding from the changes and misfortunes that might happen; and this prudent fear was not only a preservative against insolence, but even against intemperate joys.—As to the nature and motives of his wars and victories, M. Rollin considers Cyrus as having maintained a very different character from those conquerors who were influenced by ambition and avarice, and who are chargeable with violence and injustice. Although Cyrus was not in every respect justifiable, yet he reverenced the laws, and well knew that there are unjust wars, which being undertaken without just foundation, render the person concerned in exciting and producing them, accountable for the blood that he sheds. Cyrus's conquests were the consequences of the victories he obtained over Crœsus, king of Lydia, who was master of the greatest part of Lesser Asia, and over the king of Babylon, who was master of all Upper Asia, and many other countries; both which princes were the aggressors. With good occasion, therefore, is Cyrus represented as one of the greatest princes recorded in history; and his reign justly proposed as the model of a perfect government, which it would not be, unless justice had been the basis and foundation of it.—[*Platt's Univ. Biog.*

ARISTIDES.

ARISTIDES, for his strict integrity surnamed the *Just*, was the son of Lysimachus, and descended from one of the most honorable families of Athens. He was one of the ten generals of the Athenians, when they fought with the Persians at Marathon. According to the usual arrangement, the command of the army was held by each of the generals, in rotation, for one day. But Aristides, perceiving the disadvantages of such a change of commanders, prevailed on his colleagues each to give up his day to Miltiades; and to this, in a great measure, must be ascribed the victory of the Greeks. The year ensuing, he was archon, and, in this office, enjoyed so universal a popularity, that he thereby excited the jealousy of Themistocles. This ambitious man, not daring openly to attack his rival, contrived to spread a report, that A. was aiming at a kind of sovereignty, and at last succeeded in procuring his banishment, by the ostracism. It is said, that a rustic citizen, who happened to stand near A. in the public assembly which decreed his banishment, turned to him, without knowing who he was, and asked him to write the name of Aristides upon the shell with which he was going to vote. 'Has Aristides injured thee?' inquired he. 'No,' answered the voter; 'but I am tired of hearing him called the *Just*.' A. wrote his name, and returned the shell in silence to the voter. He left the city, with prayers for its welfare. Three years after, when Xerxes invaded Greece with a large army, the Athenians hastened to recall a citizen to whom they looked for aid in this emergency. Forgetting every thing but the good of his country, upon receiving intelligence that the Greek fleet was surrounded, at Salamis, by the Persians, he hastened thither with all speed, to warn Themistocles of the danger which threatened him. Touched by his generosity, Themistocles admitted him at once to his confidence, telling him that the report had been purposely spread by himself, to prevent the separation of the Grecian fleet. He also invited him to assist in the council of war, and, having determined on battle, posted him on the little island of Psyttalia, where those, whose ships were sunk during the engagement, found refuge. In the battle of Platæa, A. commanded the Athenians, and had a great share in the merit of the victory. It is thought that he was again archon the year following, and that, during this time, he procured the passage of the law by which the common people were admitted to all public offices, even that of archon. On one occasion, when Themistocles announced that he had formed a project of great importance to the state, but which he could not make known in a public assembly, the people appointed A. to confer with him on the subject. The project was to set fire to the combined fleet of the Greeks, which was then lying in a neighboring port, and thereby to secure to the Athenians the sovereignty of the sea. A. returned to the people, and told them that nothing could be more advantageous, but, at the same time, nothing more unjust, than the plan of Themistocles. The plan was at once rejected. To defray the expenses of the Persian war, he persuaded the Greeks to impose a tax, which should be paid into the hands of an officer appointed by the states collectively, and deposited at Delos. The implicit confidence which was felt in his integrity appeared in their intrusting him with the office of apportioning the contribution,—an office which he executed with universal satisfaction. He died at a very advanced age, and, what most strikingly evinces his integrity and disinterestedness, so poor that he was buried at the public expense. He left two daughters, who received dowries from the state, and a son, who was presented with 100 silver minæ and a tract of wood-land.—[*Encyclopædia Americana.*

ARISTIDES ÆLIUS.

ARISTIDES ÆLIUS, a famous rhetorician, born A. D. 129, in Bithynia, and after travelling some time, settled at Smyrna; which city having been destroyed by an earthquake, he, by his influence with the emperor Antoninus, caused it to be rebuilt.—[*Ibid.*

Animals.

We are now come to consider the last, the noblest, and the most beautiful part of the creation; the creatures for whom this earth was entirely formed, and for whose repast or use the whole of its unintelligent productions appear to have been brought forth; these are the animated tenants of our globe.

When we compare animals and vegetables together, each in their most perfect state, nothing can be easier than to distinguish them. The plant is confined to a particular spot, and exhibits no mark of consciousness or intelligence: the animal, on the contrary, can remove at pleasure from one place to another, is possessed of consciousness, and a high degree of intelligence. But on approaching the contiguous extremities of the animal and vegetable kingdom, these differences gradually disappear, the objects acquire a great degree of resemblance, and at last approach each other so nearly, that it is scarcely possible to decide whether some of those species, which are situated on the very boundary, belong to the animal or the vegetable kingdom. Indeed we find the vegetable, animal, and mineral kingdoms so closely connected, like the links of a chain, that there is no possibility of finding a disjunction in any part, nor saying with precision where the one ends and the other begins, so nearly do they approach each other in the extremities of each class.

The term animal, in a general sense, is applied to every thing that is supposed to be alive to the sensation of pain and pleasure. Under the name of animal, therefore, are included men, quadrupeds, birds, fishes, reptiles, insects. Animal literally means a *living thing*; but plants live. Linnæus has formed a climax of the grand department of creation. Stones grow; vegetables grow and live: animals grow, live, and feel.

Various are the corporeal forms, and great are the peculiarities of origination of the different animals which inhabit the globe; and equally various are their intellectual powers; beginning with man, who forms the highest link in the chain, and descending by an almost imperceptible diminution of mental powers, through an innumerable series of existences, and ending at last in mere animation alone, with a seeming privation of all mental perception whatever.

As an animal, man is strikingly distinguishable from the rest of the creatures of the earth, on account of the ingenuity with which he employs the productions of nature for his accommodation and comfort. He is also particularly distinguishable by the originality of his ideas. Instincts, in common with brutes, make up a part of his character; but he is principally the creature of experience and reflection. When an infant comes into the world, it is the most helpless of all creatures; no danger alarms it, nor can it make the smallest effort to preserve itself.—A tiger may approach it without occasioning terror; nor would it attempt to screen itself when the lion's mouth is open to devour it. The voice of the mother is not understood for many weeks; and it is but by slow degrees that it acquires knowledge, in consequence of the gradual developement of its reasoning faculties; but as its progress is more slow, so its ultimate attainments are proportionally greater than that of other animals. The chicken, within the first eight days of its life, seems to have made nearly the whole mental acquirements it is ever capable of attaining; but no period of human life can be assigned when the mental progress of man is at a stand. Man alone is able to form an idea of an abstract proposition, or to reason about distant occurrences. He alone can reason from consequences to remote causes, and from the creature trace an idea of the Creator. A sense of religion, then, is the characteristic peculiarity which decisively marks a separation between man and other animals.

But as the understanding of man, and the structure of his frame, will occupy the following sections, we will in this confine ourselves to a view of the other parts of animated nature.

Animals, like vegetables, differ in their sizes and powers, with respect to the place of their growth. Those produced in a dry sunny soil, are strong and vigorous, though not luxuriant: those again produced in a warm and moist climate are luxuriant and tender, and much larger than those produced in other countries; as in the internal parts of South America and Africa, particularly in the former place, where the earth-worm is near a yard long and an inch thick; the serpents sometimes forty feet in length; the bats as large as rabbits; toads bigger than ducks: and the spider equal in size to the English sparrow. But in the frozen regions of the north, animals are scarce; and what few there are, except the bear are not above half the size of those in the temperate zone.

Animals are also found to vary considerably according to their food or climate; and there are but few of the animal kingdom, (and these are they that are the most useful) which are found capable of attending man in his peregrination over the globe. In uncultivated nature, the animal kingdom exceeds the vegetable; but, in a state of improvement, the interest of man so directs it, that the vegetable kingdom should gain the ascendancy; for, on a review of the animal and vegetable world, we find but few animals which are intrinsically serviceable to man: while, on the other hand, numbers of them are noxious to his food, and inveterate enemies to his interest. But among the vegetable world, very few are noxious; and the greater part of them yield either food, or medicine, or some other valuable articles. Therefore, it always has, and will remain to be, the interest of man, to diminish the number of animals, and increase that of vegetables; and in assistance to his endeavours, Providence has wisely ordered it that one animal shall subsist on another; for were they to live entirely on vegetables, myriads would soon become extinct for want of support.

The number of animals, which are immediately serviceable to man, (exclusive of the smaller, among the birds and fishes, which serve for food) does not extend to one hundred; while we are acquainted with no less than twenty thousand; and even this number comprehends but a small portion of animated nature. Not only the earth, air, and sea, teem with myriads of living creatures, but also every vegetable, each single leaf, is covered with an endless number of inhabitants, whose various forms, and properties have afforded matter of astonishment to the microscopic observer.

Animals are nourished by food, taken in at the mouth, digested in the stomach, and thence by fit vessels, distributed over the whole body; but by the process by which the various vegeteble productions, which form the food of a large portion of animals is converted into part of the animal, we are totally ignorant. That this change does take place we know, but in what manner we know not any more than the animals themselves do, whose natural organs perform unknown to them the functions that are necessary for producing these changes.

The greatest part of animals have five senses, viz. seeing, hearing, smelling, tasting and feeling. These, and the way of nourishment of animals, we shall more particularly consider, as they are common to man with beasts, in the following section.

Animals are generally divided into male and female, and are called hermaphrodites, as the earth-worm, and some others. With regard to their manner of propagation, they are divided into *oviparous*, bringing forth eggs; and *viviparous*, bringing forth their young alive.

Linnæus divides animals according to their internal structure. Some have the heart with two ventricles, and hot, red blood: viz. Quadrupeds and birds; others have the heart with one ventricle, and cold, red blood, viz. Amphibia and fishes: the former being furnished with lungs, and the fishes with gills. Some have the heart with one ventricle, and cold, white serum, viz. Insects and worms; the former being furnished with feelers, and the latter with holders. All quadrupeds, which have teats, are distinguished by their teeth. These form the following seven orders; The Primates or Principals, which have four cutting teeth in each jaw; the Brutæ or Brutes, which have no cutting teeth; the Feræ or Wild Beasts, which have generally six cutting teeth in each jaw; the Glires, or Dormice, which have two cutting teeth both above and below; the Pecora, or Cattle, which have no cutting teeth above, and six or eight below; the Bulluæ, or Beasts, properly so called, with the fore teeth blunt; and the Catæ, or those of the Whale kind, which have cartilaginous teeth. This is the brief outline of this celebrated naturalist's arrangement, the names of the different animals, and their respective classes, occupy no less than two large octavo volumes; but the natural division of animated nature is universally allowed to be the five following classes; Quadrupeds, birds, fishes insects, and amphibious animals; though it must be confessed that this distribution is not exactly defined by nature; as there are many animals whose forms and qualities render it difficult to reduce them to any one of these classes.—[*Young Man's Book of Knowledge.*

Language.

Language properly signifies the expression or enunciation of human thoughts and sentiments, by means of the articulate sounds of the human voice.

Man, of all animals, only is possessed of speech. Mere sound is indeed the sign of what is pleasurable or painful, and it is, for that reason, common to most other animals; for, in this manner, do they signify their feelings to each other. But speech indicates what is expedient or hurtful, and, as a natural consequence, what is just or unjust. It is therefore given to man; for a sense of good and evil is peculiar to man alone.

The most intellectual of the brute creation frequently astonish us by actions, which can proceed only from the power of intellect, similar to our own: the capacity of speech then, is the criterion of distinction between man and the brute creation. Reason, the capital faculty and characteristic of man, would, without this extensive power of communication, have remained in inactivity, its energies unexcited, and its faculties torpid. The origin of written language is involved in great obscurity; nor has this obscurity been much lessened by the erudition that has been expended in the attempts of the learned to remove it. In the early ages of the world, there is every reason to suppose, that the difference of language in Europe, Asia, and Africa, was no more than difference of dialect and that the people of Greece, of Phœnicia, and of Egypt, mutually understood each other. The *oriental* origin of the Latin and Greek, is now generally acknowledged; and to these the Teutonic dialects have an affinity; the Arabic, the Chaldee, the Syriac, and the Ethiopic still bear the most strking resemblance to the *Hebrew*: in the Welsh, are many words analogous to it: the Celtic, also, has derived much from this and other eastern languages. The Hebrew, then, if we judge from these remarkable facts, from the mode of its derivation from its radicals, or from the simplicity of its structure, must, undoubtedly, be considered as the primitive or parent language.

An eminent linguist of the present day thinks it very likely, that the original language was composed of monosyllables, that each had a distinct ideal meaning, and only one meaning; as different acceptations of word would undoubtedly arise, either from the compounding terms, or when there were but few words in the language, using them by a different mode of pronunciation, to express a variety of things. Where this simple monosyllabic language prevailed, (and it must have prevailed in the first ages of the world,) men would necessarily have *simple ideas*, and corresponding *simplicity of manners*. The Chinese language is exactly such as this; and the Hebrew, if stripped of its vowel points, and its prefixes, suffixes, and postfixes, separated from their combinations, so that they might stand by themselves, would nearly answer to this character, even in its present state.—[*Mitchell's Encyclopædia.*

Migration of Birds.

It is believed, that many different kinds of birds annually pass from one country to another, and spend the summer or winter where it is most agreeable to them: and that even the birds of our own island will seek the most distant southern regions of Africa when directed by a peculiar instinct to leave their own country. It has long been an opinion pretty generally received, that swallows reside during the winter season in the warm southern regions: and Mr. Adamson particulaly relates his having seen them at Senegal, when they were obliged to leave this country. But besides the swallow, Mr. Pennant enumerates many other birds which migrate from Britain at different times of the year, and are then to be found in other countries, and return to Britain.

These are the hooded crow, the cuckoo, wryneck, hoopoe, grouse, ring-doves, turtle-doves, the stare, thrushes, chatterers, grosbeaks, buntings, finches, larks, fly-catchers wagtails, warblers, nightingales, black-caps, willow-wrens, white-ears, white-throats, goat-suckers, several kinds of waterfowl, such as herons, curlews, snipes sandpipers, plovers, oyster-catchers, rails, phalaropes, grebes, avosets, auks, divers, tern, petrels, mergansers, several species of ducks, and corvorants.—[*Mitchell's Encyclopædia.*

INSECTS.

Glow-worm.

There are various worms, insects, and fishes, that have a power of emitting, perhaps of secreting spontaneously, a considerable portion of light. The subject is indeed a curious one. Among these singular animals, the glow-worm and lantern-fly are the most distinguished.

The *lampyris noctiluca*, or glow-worm, is a highly curious and interesting animal. It is seen during the summer months, as late as the close of August, if the season be mild, on dry banks, about woods, pastures, and hedgeways, exhibiting, as soon as the dusk of the evening commences, the most vivid and beautiful phosphoric splendor, in form of a round spot of considerable size. The animal itself, which is the female insect, measures about three-quarters of an inch in length, and is of a dull earthy brown color on the upper parts, and beneath more or less tinged with rose color; with the two or three last joints of the body of a pale or whitish sulphur-color. It is from these parts that the phosphoric light above-mentioned proceeds, which is of a yellow color, with a very slight cast of green: the body, exclusive of the thorax, consists of ten joints or divisions. The larva, pupa, and complete female insect, scarcely differ perceptibly from each other in general appearance, but the phosphoric light is strongest in the complete animal. The glow-worm is a slow-moving insect, and in its manner of walking frequently seems to drag itself on by starts or slight efforts as it were. The male is smaller than the female, and is provided both with wings and wing-sheaths: it is but rarely seen; and it seems, even at present, not very clearly determined whether it be luminous or not. The general idea among naturalists has been that it is not, and that the splendor exhibited by the female in this species is ordained for the purpose of attracting the male. This circumstance is elegantly expressed in some beautiful lines of Mr. Gilbert White, in his History of Selburne:

> 'The chilling night-dews fall; away, retire;
> For see, the glow-worm lights her am'rous fire!
> Thus, ere night's veil had half obscur'd the sky,
> Th' impatient damsel hung her lamp on high:
> True to the signal, by love's meteor led,
> Leander hasten'd to his Hero's bed.'

Dr. Darwin also, in his admired poem the Botanic Garden, commemorates the splendor of the glow-worm among other phenomena supposed to be produced under the superintendance of the nymphs of fire:

> 'You with light gas the lamps nocturnal feed
> That dance and glimmer o'er the marshy mead;
> Shine round Calendula at twilight hours,
> And tip with silver all her saffron flowers;
> Warm on her mossy couch the radiant worm,
> Guard from cold dews her love-illumin'd form;
> From leaf to leaf conduct the virgin light,
> Star of the earth, and diamond of the night!'

It is certain that in some species of this genus the male as well as the female is luminous, as in the lampyris italica, which seems to be a native of England also, though less common here than in the warmer parts of Europe. Aldrovandus describes the winged glow-worm as having its wing-shells of a dusky color, and at the end of the body two brilliant fiery spots like the flame of sulphur.

In the Philosophical Transactions for the year 1684, we find a paper by a Mr. Waller, describing the English flying glow-worm as of a dark color, with the tail part very luminous; he maintains that both male and female of this species are winged, and that the female is larger than the male: the light of this insect was very vivid, so as to be plainly perceived even when a candle was in the room. Mr. Waller observed this species at Northaw, in Hertfordshire. From the figure given by this writer it appears to be about half an inch in length, which is much smaller than the common female glow-worm.

In Italy, this flying glow-worm is extremely plentiful; and we are informed by Dr. Smith, and other travellers, that it is a very common practice for the ladies to stick them by way of ornament in different parts of their head-dress during the evening hours.

The common or wingless glow-worm may be very successfully kept, if properly supplied with moist turf, grass, moss, &c. for a considerable length of time; and, as soon as the evening commences, will regularly exhibit its beautiful effulgence, illuminating every object within a small space around it, and sometimes the light is so vivid, as to be perceived through the box in which it is kept. This insect deposits its eggs, which are small and yellowish, on the leaves of grass, &c.

Lantern-fly.

The *fulgora lanternaria*, or Peruvian Lantern-Fly, is undoubtedly one of the most curious of insects; it is of a very considerable size, measuring nearly three inches and a half from the tip of the front to that of the tail; and about five inches and a half from wing's end to wing's end, when expanded: the body is of a lengthened oval shape, roundish or subcylindric, and divided into several rings or segments: the head is nearly equal to the length of the rest of the animal, and is oval, inflated, and bent slightly upwards: the ground-color is an elegant yellow, with a strong tinge of green in some parts, and marked with numerous bright

red-brown variations, in the form of stripes and spots: the wings are very large, of a yellow color, most elegantly varied with brown undulations and spots, and the lower pair are decorated by a very large eye-shaped spot on the middle of each, the iris or border of the spot being red, and the centre half red and half semi-transparent white: the head or lantern is pale yellow, with longitudinal red stripes. This beautiful insect is a native of Surinam and many other parts of South America, and during the night diffuses so strong a phosphoric splendor from its head or lantern, that it may be employed for the purpose of a candle or torch; and it is said that three or four of the insects, tied to the top of a stick, are frequently used by travellers for that purpose. The celebrated Merian, in her work on the insects of Surinam, gives a very agreeable account of the surprise into which she was thrown by the first view of the flashes of light proceeding from these insects. 'The Indians once brought me,' says she, 'before I knew that they shone by night, a number of these lantern-flies, which I shut up in a large wooden box. In the night they made such a noise, that I awoke in a fright, and ordered a light to be brought; not knowing from whence the noise proceeded. As soon as we found that it came from the box, we opened it; but were still much more alarmed, and let it fall to the ground in a fright, at seeing a flame of fire come out of it; and as many animals as came out, so many flames of fire appeared. When we found this to be the case, we recovered from our fright, and again collected the insects, highly admiring their splendid appearance.'—[*Gallery of Nature and Art.*

CAVES.

INDIANA CAVE.

In the southern part of Indiana there is a remarkable cave, which abounds in *Epsom salts*, and which is thus described by Mr. Adams.—'The hill in which it is situated is about 400 feet high from the base to the most elevated point, and the prospect to the southeast in a clear day, is exceedingly fine, commanding an extensive view of the hills and valleys bordering on Big Blue river. The top of the hill is covered principally with oak and chestnut. The side to the southeast is mantled with cedar. The entrance is about mid-way from the base to the summit, and the surface of the cave preserves in general about that elevation; although I must acknowledge this to be conjectural, as no experiments have been made with a view to ascertain the fact. It is probably owing to this middle situation of the cave, that it is much drier than is common.

'After entering the cave by an aperture 12 or 15 feet wide, and in height, in one place, 3 or 4 feet, you descend with easy and gradual steps into a large and spacious room, which continues about a quarter of a mile, pretty nearly the same in appearance, varying in height from 8 to 30 feet, and in breadth from 10 to 20. In this distance the roof is in some places arched, in others, a plane, and in one place particularly it resembles an inside view of the roof of a house. At the distance above named the cave forks, but the right hand fork soon terminates, while the left rises by a flight of rocky stairs nearly 10 feet high, into another story, and pursues a course at this place nearly southeast. Here the roof commences a regular arch, the height of which from the floor varies from 5 to 8 feet, and the width of the cave from 6 to 12 feet—which continues to what is called the 'Creeping place,' from the circumstance of having to crawl 10 or 12 feet into the next large room. From this place to the 'Pillar,' a distance of about one mile and a quarter, the visitor finds an alternate succession of large and small rooms variously decorated; sometimes mounting elevated points by gradual or difficult ascents, and again descending as far below; sometimes travelling on a pavement or climbing over huge piles of rocks, detached from the roof by some convulsion of nature, and thus continues his route until he arrives at the *Pillar*.

'The aspect of this large and stately white column, as it heaves in sight from the dim reflection of the torches, is grand and impressive. Visitors have seldom pushed their inquiries further than 200 or 300 yards beyond this pillar. This column is about 15 feet in diameter, from 20 to 30 feet in height and regularly reeded from the top to the bottom. In the vicinity of this spot are some inferior pillars of the same appearance and texture.

'I have thus given you an imperfect sketch of the mechanical structure and appearances of the cave. It only remains to mention its production.

'The first in importance is sulphate of magnesia or Epsom salts, which, as has been before remarked, abounds throughout this cave in almost its whole extent, and which I believe has no parallel in the history of that article. This neutral salt is found in a great variety of forms and in many different stages of formation. Sometimes in lumps varying from 1 to 10 pounds in weight. The earth exhibits a shining appearance from the numerous particles interspersed through the huge piles of dirt collected in different parts of the cave. The foregoing remark applies with truth not only to the surface, but to three feet below it. This is the greatest distance hitherto examined. The walls are covered in different places with the same article, and reproduction goes on rapidly. With a view to ascertain this fact, I removed from a particular place every vestige of the salt, and in four or five weeks the place was covered with small needle-shaped crystals, exhibiting the appearance of frost.

'The quality of the salt in this cave is inferior to none, and when it takes its proper stand in regular and domestic practice, must be of national utility. With respect to the resources of this cave, I will venture to say that every competent judge must pronounce it inexhaustible. The worst earth that has been tried will yield four pounds of salt to the bushel, and the best from 20 to 25 pounds.

'The next production is the nitrate of lime or salt-petre earth. There are vast quantities of this earth, and equal in strength to any that I have ever seen; and when potassium can be more conveniently obtained than at present, the manufacture of saltpetre must be a lucrative pursuit. There are also large quantities of the nitrates of allumia or nitrate of argyl, which will yield as much nitrate of potassium or saltpetre, in proportion to the quantities of earth, as the nitrate of lime.

'The three articles above enumerated are first in quantity and importance; but there are several others which deserve notice as subjects of philosophical curiosity. The sulphate of lime, or plaster of lime, or plaster of Paris, is to be seen variously formed—ponderous, crystallized, and impalpable, or soft, light, and rather spongy. Vestiges of the sulphate of iron are also to be seen in one or two places. Small specimens of the carbonate and also the nitrate of magnesia have been found. The rocks in the cave principally consist of carbonate of lime or common limestone.

'I had almost forgotten to state, that near the forks of the cave are two specimens of painting, probably of Indian origin. The one appears to be a savage, with something like a bow in his hand, and furnishes the hint, that it was done when that instrument of death was in use. The other is so much defaced that it is impossible to say what it was intended to represent.'—[*Worcester's Sketches.*

THE LYCEUM SYSTEM.

The first Lyceum mentioned in history was established by Aristotle, on the banks of the Issus in the suburbs of Athens, about three hundred and fifty years before Christ, with Alexander the Great for one of its first pupils. The course of exercises pursued, and the instruction given at this school was more practical and more designed for the great mass of the community than other institutions in Greece at that time.

During the day the regular permanent pupils of Aristotle devoted themselves to a thorough systematic course of studies and practical exercises; in the evening mixed assemblies collected to hear lectures on various popular subjects of science and of useful knowledge.

Since the time of Aristotle, institutions by the same name, but differing much in their characters and designs, have been established in various parts of the world. Great numbers of institutions with other names, but with similar objects, have been established all over the civilized world. Indeed the social principle of our natures is so prominent, as to render some institutions of a social character, both necessary and certain, where human beings are collected. Even among savages, where there are no formal institutions of learning established, the social principle operates with great power and through various channels. It is by the various social arrangements among savages, that they acquire nearly the whole of their knowledge, which is certainly not inconsiderable.

Although social institutions, under the title of Lyceums and various other names, have been in successful operation in Europe, Asia and America for centuries, a system of instruction and of institutions founded on that principle, first commenced in the world in the year 1826, in the county of Worcester Mass. In the fall of that year, the citizens of fifteen or twenty towns in that county, organized societies for mutual social improvement, not only among the members of each society but by the co-operation of the several societies in their joint efforts. In the course of six or eight weeks fifteen or twenty Town Lyceums were organized, and a County Lyceum, by which the others were so united and combined as to aid each other in the great and common object in which they were engaged.

So powerful is that principle on which these truly popular institutions are founded, and so happy and so practical their results, that from this humble and unpretending beginning six years ago, they have not only spread through all the states, and have increased their objects, enlarged the sphere of their operation, and added new vigor and new success from year to year as they were taught by experience, and aided by those mutual efforts and social principle on which they are founded. While on the one hand, the system has become more general, nearly every state having its Lyceum, and the nation its Lyceum, it has become more personal by finding its way into neighborhoods, schools and families.

No doubt now remains of the permanency of the Lyceum system or of its great power and happy results upon all our other national and republican institutions or upon the general cause of education in our world. Indeed, there is no institution in the world, which appears so well fitted to unite into one great family the whole human race, or so well calculated to raise that family to the character, the dignity and the happiness, permitted and invited by our natures and designed by our Creator.

The first exposition of this system given to the public is in the tenth number of the Journal of Education. That exposition is brief, and not accompanied by the name which was afterwards adopted for the institution, but not at that time decided upon. A few months after this time a pamphlet, containing a more full exposition of the system than that first given in the Journal of Education, was published and distributed gratuitously to some extent through the community. In a few months after that another pamphlet going still more fully into the subject was published and circulated in great numbers into all parts of the country. This was followed by several others, together with numerous circulars, the whole distributed gratuitously at an expense of more than five hundred dollars to one individual for the simple article of printing.

Just before the first experiment was tried upon the system in the county of Worcester, the title Lyceum, for various reasons, was concluded to be an eligible one, by which the proposed institution, in its various branches, should be known. And though the name at first presented no small obstacle in the way of its general introduction, that obstacle is now entirely removed, so that the spirit, the operations, and the name of this social system, are finding their way into all the ramifications of society, and are producing their results upon all the objects of our pursuit and through all the principles of our nature.

We now have a National Lyceum, State Lyceums, County Lyceums, Town Lyceums, Teachers' Lyceums, Farmers' Lyceums, Mechanics' Lyceums, Seamens' Lyceums, Ladies' Lyceums, Mothers' Lyceums, Social Lyceums, Juvenile Lyceums, School Lyceums, Family Lyceums, and last though to us not least, the 'Family Lyceum.'

METEOROLOGICAL DIARY FOR OCTOBER, 1832.

Observations taken at 8, A. M.: 2 & 6, P. M.

DAYS.	AVERAGE.	THERMOMETER.			WINDS.	WEATHER, &c.
1	65	61	68	67		Clear and very cold.
2	62	53	66	66		Clear and cool.
3	63	52	66	70	N. W.	Clear and cool.
4	68	60	72	72	N. W.	Broken Clouds.
5	71	68	73	72	S. W. S. S. E.	Cloudy and Rain.
6	72	69	72	75	N. E. S. E. N. E.	Cloudy. Clear in the afternoon.
7	73	69	74	76	N. E.	Clear all day.
8	79	72	82	82	S. W. S. E.	Clear. Afternoon, broken clouds.
9	77	76	78	78	S. E.	Thunder and rain all day.
10	80	76	83	82	S. E. N. E.	Clear in the morning. Hazy.
11	81	76	84	83	N. E. S. E. S.	Broken clouds. Clear afternoon.
12	82	78	84	84	S. E.	Clear all day.
13	81	76	84	84	S. E.	Clear all day.
14	80	76	82	81	S. W. N. W. N. E.	Broken Clouds. Rain at 6 o'clk.
15	66	66	68	65	N. E.	Cloudy and rain all day.
16	69	62	72	72	N. E.	Cloudy.
17	74	68	76	77	N. E.	Cloudy.
18	77	72	80	78	N. E. E.	Clear all day.
19	75	72	77	77	N. E.	Clear morn. Broken clouds, aft'n.
20	76	72	78	78	N. E.	Cloudy and a little rain.
21	77	73	80	79	N. E. S. E.	Cloudy morn. At 8, a little rain.
22	79	75	82	81	E. N. E. S. E.	Broken Clouds.
23	73	73	74	72	N. W.	Cloudy. Rain last night.
24	64	60	66	65	N. W.	Clear and cold.
25	60	54	62	62	N. W. N. E.	Clear. Frost last night.
26	61	53	64	66	N. W. N. E. N. W.	Clear and cold. Frost last night.
27	61	54	65	64	N. E.	Clear and cool.
28	61	53	68	62	N. E.	Clear and cool.
29	61	53	66	64	N. E.	Clear and cool.
30	62	54	68	64	N. E. E.	Broken Clouds.
31	63	56	68	66		Cloudy. A little rain.

REMARKS FOR OCTOBER, 1832.

1. These Observations have been made three times a day, viz.: at 8, A. M., 2 & 6, P. M. 2. The mean of the thermometer during the month 71°, 6° colder than the preceding month. Max. 82° on the 12th—Min. 60° on the 25th. 3. Ther. Ex. at 8 o'clock, A. M., Max. 78° on the 12th—Min. 52° on the 3d—Mean 66°. 4. Ther. Ex. at 2 o'clock, P. M. Max. 84° on the 11th, 12th and 13th—Min. 52° on the 25th—Mean 74°. 5. Ther. at 6 o'clock, P. M., Max. 84° on the 12th and 13th—Min. 62° on the 12th—Mean 73°. 6. There has been but one rain, accompanied with thunder, this month, on the evening of the 8th; only six days showery, on the 5th, 14th, 15th, 20th, 21st and 31st. 7. Winds; N. E. and E. 15 days—N. W. and W. 7 days. S. W. and S. 4 days—S. E. 5 days. The weather has been decidedly clear 12 days, cloudy 7, variable 12. We have had more N. E. winds and less rain than is usual for October. The weather for the month, variable; on the evenings of the 24th and 25th, there was a little frost. Vegetation and plants are still in their verdure. 8. The following planets were visible during the month, viz.: Mercury at his superior conjunction on the 23d; Mars was stationary on the 14th; Vesta in conjunction on the 8th; Juno do. on the 6th; Ceres in opposition on the 31st; Uranus was stationary on the 25th. 9. If not very much mistaken, we have had one observation of Biela's Comet, during the month. In coming to this conclusion, we were governed by the following rule, viz.: At the time of observation, Mars, the Pleiades, Beta, Aldebaran, Castor and Pollux, all being visible, and no star of the magnitude being known to occupy the place where it then was in the constellation, and the foregoing planet and stars directly corresponding in their points of compass to it, we have no doubt of its being the real Comet. 10. Our city is healthy.

Chatham Academy. Yours, W. H. WILLIAMS.

LYCEUMS.

NEW-HAMPSHIRE LYCEUM.

We have received requests from several sources in New Hampshire, on the subject of a State Lyceum for that state; and a Teacher of the first respectability in the state has proposed the last Tuesday in this month as the time for a State Convention to be held for the purpose.

GEORGIA LYCEUM.

About a year since, a Society, if not with the name, with the object of a State Lyceum, was organized by the friends of Education in Georgia.—The influence of that society upon the literary institutions of that state, has been striking and happy.—Besides the College at Athens, which is said to be in a more than usually prosperous state, several Academies and High Schools in Georgia, of the very first respectability, have come to our knowledge.

A seminary in Savannah, under the charge of three gentlemen of great intelligence and skill in teaching, numbers nearly two hundred pupils. The Scottsboro' Institute, under the charge of Rev. Dr. Brown, a female seminary near Milledgeville, has over one hundred pupils. One of the most flourishing institutions in the State, or in the Union, is at Mount Zion, in Hancock County, Ga., under the charge of Rev. Mr. Burman, brother of Rev. Dr. Burman, lately of Troy, N. Y. Thomas B. Slade, of Clinton, has a flourishing seminary. A few days since, Rev. Sereno Taylor, recently in a large academy in Augusta, Ga. was in Boston, in behalf of a Female Seminary about getting into operation under the most liberal arrangements and provisions, in Sparta, Ga. Several other schools in Georgia, within our knowledge, are in a most flourishing condition.

Most of these seminaries are well supplied with apparatus, periodicals, &c., and the others have made arrangements for a supply.

THE BOOK OF NATURE.

THE INTERNAL STRUCTURE OF THE EARTH.

Thus in thy world material, MIGHTY MIND,
Not only that which solaces and shines,
The ROUGH, the GLOOMY, challenges our praise.

THE treasures of the mineral kingdom, being more concealed, are not so alluring to the senses, and are of course, to most men, less interesting than animals or vegetables; but they present themselves to the reflecting mind under innumerable points of view that are interesting, chiefly as affording the materials on which nature, by her slow but certain operations, is continually producing changes that tend to augment the multiplication of plants, for the preservation and the accommodation of animals, while man, in the meanwhile, is endowed with faculties which enable him to avail himself of the qualities they possess for his own purposes.

When we penetrate the dark and subterraneous magazine of nature, we find veins fraught with the richest METALS; from hence comes that which gives value to the monarch's crown, and weight to his sceptre; which, formed into coins, give energy and life to traffic, rewards the toils of labor, and puts it in the power of the affluent to warm the bosom of adversity, and make the widow and the orphan sing for joy; beaten out into an inconceivable thinness, is made to cover with a transcendent lustre some of the coarsest of nature's productions, and renders them ornamental in the palace of the great.

Here also is laid up the pale brightness of the SILVER, which, formed into a variety of domestic utensils, sets off with peculiar lustre the choicest dainties of the rich man's table: and here is found the ponderous LEAD, from which the cool and clean cistern is formed, as well as those convenient and safe acqueducts, by which the useful element of water is conveyed into the very hearts of our dwellings. Here too are stores of COPPER and TIN, by which sundry utensils, formed of the former metal, are rendered more safe and fit for use: and here do we find in profuse abundance MINES, whose contents, although they may not be reckoned of equal value, have been found to be more beneficial in their services to man, than any of those already mentioned. IRON furnishes the mechanic, the artist, and the laborer with their most useful implements and tools; by Iron the farmer is enabled to tear up the most stubborn soil; Iron secures our dwellings from the midnight thief, and confines, by its massy bars, the disturber of our peace to his gloomy cell; by means of Iron, the vessel tossed with tempest is firmly attached to a place of safety, or prevented from being broken up by the raging elements, when overtaken by a storm in the midst of the watery waste.

In these dark vaults are also found that subtle insinuating metal, QUICKSILVER, which so much resembles a fluid; the uses of which in philosophy and medicine are so well known, as well as its importance in various arts and sciences.

From hence, also, are extracted a multitude of MINERAL SALTS and SALINE SUBSTANCES, together with a variety of SULPHUROUS bodies. The astringent Alum, the green Borax, the volatile Nitre, the blue Vitrol of Hungary and Cyprus, the green of Germany and Italy, the shining Bismuth, the glittering Antimony, the brown-colored Cinabar, the white Chalk, have all an origin in these dark apartments, as also that truly invaluable black inflammatory substance COAL, which ministers to our comfort in the room, presents its services in the kitchen, assists the chemist and philosopher in their experiments, renders the work of the artist more easy, transforms the coarsest materials into transparency itself, by which means the light of day is admitted into our dwellings, while the cold inclemency of the weather is excluded—the astronomer is enabled to extend his researches to worlds before invisible to mortal eye—the naturalist to observe the minutiæ of creation—and the feeble eyes of old age furnished with new and invigorating powers. From hence also is derived that wonderful mineral whose magnetic quality guides the mariner, with unerring precision, beyond the pillars of Hercules, and enables him to find his solitary way across the pathless deep.

Here also in these dark recesses are conveniently laid up, a variety of strata of STONES, and beds of FOSSILS; and hence derive their origin a number of valuable JEWELS and transparent GEMS, as well as the firm and compact Marble, the Alabaster, the Porphyry, and the hard pellucid Flint.

Here also are to be found those quarries of Stones from which are constructed secure and comfortable dwellings for man and beast—by which the arms of the pier are strengthened to repel the surges of the sea—the rampart is raised above the basis nature had formed—our property secured from the depredations of intruders—the arched bridge thrown across the broad and rapid stream, and the stupendous aqueduct carried over the deep-sunk glen.

Here too are deposited a variety of curious Fossils and extraneous substances, which baffle the wisdom of the wise, and puzzle the reasoning of the naturalist to account for: and here are those vast layers or strata of earth, in all their variety, whose nature and uses are more apparent—where the vegetable kingdom derives its support and nutriment, the trees of the forest spread their wide-extended roots, and the tender herb and flower of the field takes hold of the dust; where the pliable worm forces itself quietly along, the mole finds its darksome way, the foxes have holes, and the coneys burrow themselves. Here is that tough tenacious species of earth which administers its services to man in such a variety of shapes, and acts as a substitute for other commodities in situations where nature has denied them. Are some in want of stones for building? CLAY, by undergoing a process, becomes firm and hard, to withstand the most rigid blasts of winter. Are there no slate quarries in the neighborhood? Clay, in the shape of Tiles, forms an excellent substitute. Are we in want of lead for pipes to convey our water from a distance? Clay comes seasonably to our aid. In short, by this meanlooking, dirty, and despised substance, we are abundantly supplied with a great variety of utensils and vessels, neat in their structure, cleanly in the use, and though cheap in the purchase, extremely valuable in point of utility. Here are also commodiously lodged, a variety of other useful earths, which it would encroach too much on our limits to attempt to enumerate. These, with an innumerable variety of other useful and valuable materials, of which those we have mentioned may be considered as only a specimen, are safely locked up by PROVIDENCE *in this great storehouse of Nature* and *the key given to Industry* to take out and apply as necessity may require, or circumstances direct; and in the disposition of which we may be at a loss what most to admire, the *bounty* of the Creator, in thus so largely making provision for our numerous wants, or his *wisdom* in placing them at such convenient distances below the earth's surface, as neither to obstruct by their bulk the operations going on upon, or to be beyond the reach of moderate labor, when the necessities of man call aloud for their use.

How inconvenient would it have been, and what small space left for cultivation, had these useful layers of STONE and LIME, COAL and CLAY, been promiscuously scattered about in our fields and vineyards, or piled up in uncouth, naked, and deformed masses, without the slightest depth of soil for a covering; and how inaccessible to human labor and ingenuity; or to what an expense of loss of time must man have been put in coming at them, had they been sunk miles instead of feet into the bowels of the earth? Reflecting upon these things, we have good reason to exclaim, in *goodness* as well as in *wisdom* hast Thou made them all!'

THE FORM OF THE EARTH.

'O nature! all-sufficient! over all!
Enrich me with the knowledge of thy works!'

ON returning from our subterraneous excursion, our attention is naturally directed to the *shape* or *form* of that stupendous fabric, which contains so many convenient apartments, and is enriched by so many valuable materials; and were we to trust to appearances as they present themselves to our limited powers of vision, we might be led to conclude (as was the opinion of some of the ancients,) that the earth is a wide-extended flat, bounded by the horizon.

This belief, however, is now completely exploded, and the figure of the earth demonstrated to be globular, by the voyages of a number of circumnavigators, from the days of the famous MAGELLAN down to those of our illustrious countryman, Captain COOK.

By these voyagers it has been fully ascertained that a vessel leaving Europe in a certain direction, may return to the point from whence she set out, without altering her course farther than is necessary to avoid intervening obstacles, or give her, what the sailors call *sea-room*.

The sphericity of the earth is also apparent from the circumstance that two ships at sea, sailing in contrary directions till they lose sight of each other, first do so by the disappearance of the hulls and lower rigging, and afterwards of the higher sails and top-masts. The roundness, from north to south, is evident from the sinking of northern stars to the horizon, till they actually disappear to those who travel far Southward; and from east to west by the difference of sunrise in proportion as we go eastward or westward.

The form of the earth being therefore proved by arguments the most incontrovertible, to be that of a globe or sphere, permit us here to pause and acknowledge the wisdom and goodness of the Creator, as manifested in that particular form! This wisdom and goodness is highly apparent, when we consider that this is the most capacious, compact, and durable of all figures, the most convenient for a body in motion, for the equal distribution of light and heat, for the proper disposal of land and water, as well as for the beneficial influence of the winds.

The earth, which is the habitation of so many creatures, must be sufficiently capacious not only to contain them, but what is necessary for their preservation; and being, as it were, the basis of this sublunary creation, it must be so firmly and compactly girt together, as to be beyond the reach of accident to destroy any of its parts, till the fiat shall have gone forth that time shall be no more.

Had it been of an ANGULAR form, the points of the angles behoved to have been considerably weakened by their distance from the centre of gravity, and consequently would have been in continual danger of being loosened, or flying off, by the rapidity of the earth's diurnal motion round its axis; or had it been possible for them to have remained, what resistance must these angles have occasioned in the performance of that motion! What a continual state of perturbation and tempest in the air must they have caused! How incommodious to the diffusion of light and heat, and for the wise and useful distribution of the waters!

THE SURFACE OF THE EARTH.

In casting our eyes abroad over the face of the earth, we observe it covered with two great bodies of LAND and WATER; but as it is to the appendages and productions of the former we mean first to direct our thoughts, we will leave the consideration of nature's mighty reservoir, and the wonders of the ocean, to an after occasion, and will proceed to consider the magnificent scene which the *dry land* presents.

The first thing that here strikes the imagination is that wonderful diversity every where observable, and those numerous inequalities so conspicuous on its surface. On one part, we behold the gently rising hillock scarcely perceptible amidst the surrounding level: in another, the tremendous precipice, yawning horribly over the mountain's brow! Here, a deep-sunk glen, embosomed among rocks, recedes from the eye, and screens the little rivulet that glides along its bottom; there, the lofty summits of the *Andes* and the *Alps*, with cloud-capt tops wrapt in garments of perpetual snow, bid defiance to vegetation or smile above the blast in sunshine, while the reverberating sound of distant thunder proclaims the raging of the storm below.

In one place we behold the pleasantly sheltered meadow, decked in all its luxuriance of herbage, and in another a wide naked waste, or sea-like fen, losing itself in the distant prospect. Here, broad and rapid rivers separate nations at variance; there the purling stream, partly fordable, and partly surmounted by the convenient bridge, unites and connects those who enjoy the mild blessings of peace. Here a vast tract of uncultivated heath stretches across the districts of the mountains, while lakes of considerable magnitude lave their basis, and cover by their limpid waves the interjacent valleys.

We have just been considering the earth as a globular body. But how, it may be asked, are we to reconcile this with those unequal appearances observable on its surface? To this we answer, that the elevation of the highest mountain bears no more proportion to the diameter of this wonderful structure, than the inequalities on the rind of an orange does to its bulk; and although these may render it, comparatively speaking, a little uneven, they do nothing to subtract from the beauty of its appearance, or the general roundness of its figure.

Deformities, indeed, they cannot be called; for if the human mind delights in variety, these inequalities present us with a variety the most pleasing and picturesque; and if the contemplative philosopher is captivated by the multiplicity of nature's productions, these furnish food for the most keen researcher into the wonders of creation. But a gratification of taste for the sublime and beautiful were not the only objects the Creator had in view in this diversity of the earth's surface.

MOUNTAINS AND VALLEYS.

These have other great and important uses. Is Health the greatest of all earthly blessings?—to one class of valetudinarians the mountain breeze is beneficial, while to another the genial warmth of the well-sheltered valley produces the most salutary effects. Does the east wind rage with fury, or cold with its freezing particles visit us from the north? the deep-sunk bosom of the valley, or the *lee-side* of the mountain defend us from the fury of the tempest, and shelter us from the raging storm.

By this happy diversity of towering mountain and sinking dale, we have a variety of soils in a small compass, and are furnished with the productions of different climates almost at our doors. These serve also for the harbor and lodgment of a variety of animals that would have been ill accommodated in the open plain. They are also convenient not only for the generating of metals and minerals, but for digging them out with infinitely less trouble and expense than if they had been situated at considerable distances below a level surface; and mountains are the birthplace of many valuable mines and precious stones.

In the burning regions of the torrid zone, ridges of mountains, running from east to west, arrest with their towering heads the vapors in their flight, and condensed into rain, force back the fugitives in cooling and refreshing showers.

In places where earthquakes prevail, mountains are converted into funnels, for the purpose of vomitting forth these volcanic eruptions of liquid fire, which, but for such events, might have shaken kingdoms from their foundations, and swallowed up provinces, in one mighty gulph.

But the most general use to which Providence seems to have applied mountains and valleys, and consequently, without doubt, the most important one for which they were designed, is the *elevation* of SPRINGS, and convenient distribution of WATERS, agreeable to the language of the Royal Psalmist; 'They go up by the mountains, they go down by the valleys, unto the place which thou hast appointed for them.' And this use alone would have afforded us abundant motives of gratitude and thankfulness, although there had been no other; that from mountains and valleys we are supplied with these inestimable blessings.

SPRINGS AND RIVERS.

Water is not only one of those necessary elements of which our very means of existence are composed, but it administers to our wants and conveniences on a variety of occasions, and in many different shapes.

With water our choicest bread is mixed, and it makes part of the composition of our favorite beverage. By water the beasts of the field, and the fowls of the heavens, quench their thirst; and by means of it the lofty cedar of Lebanon derives its nutriment, as well as the tender herb that creepeth against the wall. By this necessary and useful fluid we are assisted in many a tedious and laborious operation:—Formed into canals it helps the deep-laden barge forward in its progress; confined into dams it sets the ponderous mill-wheel in motion; or evaporated into steam, it puts into play the massy arms of the huge engine.

But how does it come to pass that water is rendered thus serviceable? It is partly owing to the wise manner in which the great Creator distributes it from his treasures, by causing springs to take their rise in elevated situations, and partly from the general law impressed upon fluids to regain their level, that water is impelled forward in its course, and made to surmount so many obstacles in its progress to the sea, while its suitable consistency fits it for being easily turned aside, and diverted into such other channels as the necessities of man may require.

If, as might have been expected, springs had been confined in general to the lower situations of the earth, extensive tracts must have been left unwatered, while plains in their immediate neighborhood would have been deprived of their fertility by inundation, or rendered pestilential by stagnant waters pent up without the means of escape. Had water been deprived of that admirable property of rising to its level, how liable would it have been to be obstructed in its progress by every insignificant hillock, or trifling rise of the ground; and, with respect to its consistency, besides being rendered incapable of being converted to so many useful purposes, had it been *thinner* how would it have answered the purpose of supporting so many burdens, or keeping within its bounds; had it been *thicker* how would it have been adapted for quenching thirst, or ascending the minute tubes of the vegetable tribe.

But by this wise and beneficial arrangement, rivers being elevated at their head, in situations at a distance and remote from the sea, are necessitated to pass over a large tract of country before they lose themselves in the main, and following the course of those numerous sunken beds made for them in the valleys, they are at once confined within their proper limits, and made to wind in many a lengthened turn, to the more copious diffusion of their benefits than would otherwise have been the case; while their pliable nature renders them easily turned aside as they glide along, to water those fields removed at a small distance from their banks, or for other purposes to which the ingenuity of man may make them subservient.

MINERAL AND MEDICINAL WATERS,

Are also amply provided by nature, and dispense their salutary virtues in a variety of situations. These are not so numerous as the other, but are sufficiently so for the purposes to which they are adapted; for all men, and every living creature, need food, but we have reason to be thankful that all need not the aid of medicine. Many there are, however, who stand in need of their beneficial influences, and many an invalid have they been the means of restoring to renovated powers, and the blessings of health. Like the pool of Bethesda, they may be said to be of a healing nature; but blessed be the adorable Physician who has opened up these fountains, that they have been found to be for the healing of multitudes who resort thither, and not for him alone who is fortunate enough to be first plunged into the troubled stream.

QUESTIONS ON LYCEUM No. 17.

OF what empire was Semiramis queen, and when did she live?

At what siege did she distinguish herself?

How did her first husband come to his end? also her second?

What countries did she subdue?

Whose daughter was Cleopatra, and where did she live?

Of what heritage did her brother deprive her?

To what country did she retire, to be removed from her brother?

What Roman Emperor defended her against her brother?

What did Cleopatra do with herself after the defeat of Antony?

How did Cleopatra treat her younger sister?

At what naval engagement did she have the command, and what was the result?

In what state is Wier's cave and what other cave in the vicinity?

What methods are used for checking fermentation?

What town in England has a commodious Lyceum for the society of the same name?

Which is the greatest cause of poverty, the want of means or the misapplication of the means of sustenance and comfort?

What instances are there of misapplication of labor or the fruits of labor?

What science is most important to be understood by man?

What objects can be effected by a City Lyceum?

What number of citizens might be accommodated at a City Lyceum 50 feet by 70 three stories high, with one lecture a week?

What advantages would a City Lyceum derive by being made a place of resort for strangers?

How could City Lyceums co-operate with seamen?

What might Lyceums in cities do, to supply those in country villages with Cabinets of Natural History?

How can county Lyceums co-operate with those in cities in a general system of exchanges in specimens of Natural History?

Which ought to lead, and which to follow in supplying our country with Lyceum buildings, Lyceums in the cities or those in the country?